

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

#16  
Pet re  
Aband.

Application Serial No. .... 09/814,260  
Filing Date ..... March 21, 2001  
Inventor ..... Scott E. Moore et al.  
Assignee ..... Micron Technology, Inc.  
Group Art Unit ..... 3724  
Examiner ..... T. Eley  
Customer No. .... 021567  
Attorney's Docket No. .... MI22-2439  
Title: Semiconductor Workpiece Processing Methods, A Method of Preparing  
Semiconductor Workpiece Process Fluid, and A Method of Delivering  
Semiconductor Workpiece Process Fluid to a Semiconductor Processor

RECEIVED

MAR 02 2004

OFFICE OF PETITIONS

TO: MAIL STOP PETITION  
Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

EL979954615

FROM: James D. Shaurette (Tel. 509-624-4276; Fax 509-838-3424)  
Wells, St. John, P.S.  
601 W. First Avenue, Suite 1300  
Spokane, WA 99201-3828

**PETITION UNDER 37 C.F.R. 1.137(a) TO WITHDRAW HOLDING OF  
ABANDONMENT FOR PATENT APPLICATION**

Applicants, Scott E., Moore, Scott G. Meikle, and Magdel Crum hereby petition to withdraw the holding of abandonment for the above-identified application entitled, "Semiconductor Workpiece Processing Methods, A Method of Preparing Semiconductor Workpiece Process Fluid, and A Method of Delivering Semiconductor Workpiece Process Fluid to a Semiconductor Processor."

On November 10, 2003, Applicants timely filed a Response to the July 10, 2003 Office Action by facsimile as evidenced by the enclosed copy of a Certificate of Facsimile Transmission Under 37 CFR 1.8, the enclosed Statement Attesting to Transmission of

PTO Correspondence, a copy of the sending unit's report confirming transmission, and the Auto-Reply Facsimile Transmission received from the PTO. Pursuant to 37 CFR 1.6(d), 1.8 and the Auto-Reply Facsimile Transmission received from the Patent and Trademark Office, the response was timely filed within the proper statutory six month period for response, was transmitted via facsimile to the U.S. Patent and Trademark Office in accordance with 37 C.F.R. 1.6(d), and the correspondence included a certificate for each piece of correspondence stating the date of transmission. Natalie King, assistant to the undersigned, signed the certificate of facsimile transmission and had a reasonable basis to expect that the correspondence was transmitted on the date indicated on the certificate. In addition, the Auto-Reply Facsimile Transmission of successful transmission was received evidencing a successful transmission of 33 pages to the PTO on November 10, 2003.

In accordance with 37 CFR 1.137(a), the undersigned became aware of the apparent abandonment of this application on February 12, 2004 upon reviewing a Notice of Abandonment mailed February 9, 2004 by the Patent and Trademark Office for failure of Applicants to respond to the July 10, 2003 Office Action. The undersigned hereby promptly informs the Office of the previous transmission after becoming aware that the application has been abandoned and apparently the received transmission has been misplaced by the PTO. Applicants hereby supply an additional copy of the previously transmitted correspondence and certificate.

Applicants further submit the enclosed Statement Attesting to Transmission by Natalie King further evidencing proper filing of the Response to Office Action dated July 10, 2003 on November 10, 2003. The response was filed appropriately and in a timely

manner in accordance with the statutory period for response to the July 10, 2003 Office Action. Applicants hereby diligently and timely file this Petition to Withdraw Holding of Abandonment and revive the application.


In addition to the above, Applicants hereby submit copies of the transmittal form (PTO/SB/21) for the response, a fee transmittal for the response, a Supplemental Information Disclosure Statement, cited reference, Request for Extension of Time, and the response to July 10, 2003 Office Action.

Applicants respectfully petition to withdraw holding of abandonment for the present patent application. The undersigned respectfully requests a telephone call to (509) 624-4276 if the petition under 37 C.F.R. §1.137(a) is not believed to be grantable.

The Commissioner is hereby authorized to any deficiencies or credit overpayments to Deposit Account No. 23-0925 in connection with the submitted petitions under 37 C.F.R. §1.137(a).

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statement may jeopardize the validity of the application or any patent issued therefrom.

Date: 2/20/04

  
Signature of Practitioner filing under Rule 34(a)  
James D. Shaurette  
Reg. No. 39,833  
601 W. First Avenue, #1300  
Spokane WA 99201  
Tel. No. (509) 624-4276  
Customer No. 021567

TO:

### Fax Information

Date Received:

Total Pages:

11/10/2003 8:15:05 PM [Eastern Standard Time]  
33 (including cover page)

Received  
Cover  
Page

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EL979954615

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

[illegible]

Mail Stop For Amendments  
Assistant Commissioner for Records  
P O Box 1490  
Alameda CA 94501 1450

CERTIFICATE OF FACTS AND TRANSMISSION UNDER 17 CFR 1.0

I hereby certify that the following papers are being faithfully transcribed to the Patent and Trademark Office at (703) 872-8302 on the date shown below:

- 1 Transmittal Form, 750/5A/21;
- 2 Supplemental Information Clarifying Statement, with Form FTC-1660
- 3 Credit Review, (1)
- 4 Response to 7/10/2003 Office Action;
- 5 Fee Transmittal (FTC/5B/17,
- 6 Request for Extension of Time (1 Month)

Dec. 10/1903.

By                       
 State, Fla  
 Telephone No (304) 574-4775  
 Facsimile No (304) 574-4424

NUMBER OF PAGES IN FACSIMILE: 33

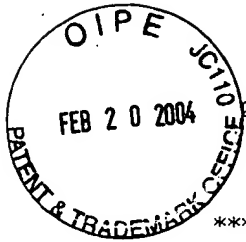
TABLE 1. *Estimated and observed values of the parameters of the model for the 1997-1998 season*

MODE = MEMORY TRANSMISSION

START=NOV-10 17:23

END=NOV-10 17:32

FILE NO. = 225



NO.	CGM	ABBR/NTWK	STATION NAME/ TELEPHONE NO.	PAGES	PRG.NO.	PROGRAM NAME
001	OK		70#1309022*1663	033/033		

-WELLS ST. JOHN, P.S. -

\*\*\*\*\* -WELLS ST. JOHN - \*\*\*\*\* 5098383424- \*\*\*\*\*

# IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. .... 09/814,260  
 Filing Date ..... March 21, 2001  
 Inventor ..... Scott E. Moore et al.  
 Assignee ..... Micron Technology, Inc.  
 Group Art Unit ..... 3724  
 Examiner ..... T. Eley  
 Attorney's Docket No. .... MI22-1663  
 Title: "Semiconductor Workpiece Processing Methods, A Method of Preparing  
 Semiconductor Workpiece Process Fluid, and A Method of Delivering  
 Semiconductor Workpiece Process Fluid to a Semiconductor Processor"

Mail Stop Fee Amendment  
 Assistant Commissioner for Patents  
 P.O. Box 1450  
 Alexandria VA 22313-1450

**EL979954615**

## CERTIFICATE OF FACSIMILE TRANSMISSION UNDER 37 CFR 1.8

I hereby certify that the following papers are being facsimile transmitted to the Patent and Trademark Office at (703) 872-9302 on the date shown below:

1. Transmittal Form (PTO/SB/21)
2. Supplemental Information Disclosure Statement with Form PTO-1449
3. Cited Reference (1)
4. Response to 7/10/2003 Office Action
5. Fee Transmittal (PTO/SB/17)
6. Request for Extension of Time (1 Month)

Dated: 11/10/2003

By: [Signature]  
 Natalie King  
 Telephone No. (509) 624-4276  
 Facsimile No. (509) 838-3424

NUMBER OF PAGES IN FACSIMILE: 33



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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Filing Date ..... March 21, 2001  
Inventor ..... Scott E. Moore et al.  
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Mail Stop Fee Amendment  
Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

**EL979954615**

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I hereby certify that the following papers are being facsimile transmitted to the Patent and Trademark Office at **(703) 872-9302** on the date shown below:

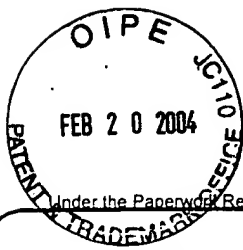
1. Transmittal Form (PTO/SB/21)
2. Supplemental Information Disclosure Statement with Form PTO-1449
3. Cited Reference (1)
4. Response to 7/10/2003 Office Action
5. Fee Transmittal (PTO/SB/17)
6. Request for Extension of Time (1 Month)

Dated: 11/10/2003

By: \_\_\_\_\_

Natalie King  
Telephone No. (509) 624-4276  
Facsimile No. (509) 838-3424

NUMBER OF PAGES IN FACSIMILE: 33



PTO/SB/21 (08-03)  
Approved for use through 08/30/2003. OMB 0651-0031  
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE  
Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	09/814,260
	Filing Date	March 21, 2001
	First Named Inventor	Scott E. Moore et al.
	Art Unit	3724
	Examiner Name	T. Eley
Total Number of Pages in This Submission	Attorney Docket Number	MI22-1663

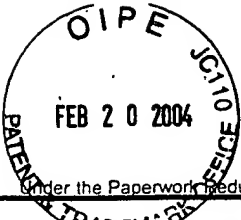
ENCLOSURES (Check all that apply)		
<input checked="" type="checkbox"/> Fee Transmittal Form	<input type="checkbox"/> Drawing(s)	<input type="checkbox"/> After Allowance communication to Technology Center (TC)
<input type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input checked="" type="checkbox"/> Amendment/Reply	<input type="checkbox"/> Petition	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation	<input type="checkbox"/> Status Letter
<input checked="" type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Change of Correspondence Address	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Terminal Disclaimer	Form PTO -1449
<input checked="" type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> Request for Refund	Cited Reference
<input type="checkbox"/> Certified Copy of Priority Document(s)	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Response to Missing Parts/Incomplete Application	Remarks	
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53	<b>EL979954615</b>	

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	James D. Shaurette, Reg. No. 39,833 Wells, St. John, P.S.
Signature	
Date	11/10/03

CERTIFICATE OF TRANSMISSION/MAILING		
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.		
Typed or printed name	Natalie King	
Signature		Date 11/10/2003

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.



Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 522.00

## Complete if Known

Application Number	09/814,260
Filing Date	March 21, 2001
First Named Inventor	Scott E. Moore et al.
Examiner Name	T. Eley
Art Unit	3724
Attorney Docket No.	MI22-1663

## METHOD OF PAYMENT (check all that apply)

☐ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit  
Account  
Number  
Deposit  
Account  
Name

23-0925

Wells St. John, P.S.

The Director is authorized to: (check all that apply)

☒ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	

SUBTOTAL (1) (\$ )

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims	Extra Claims	Fee from below	Fee Paid
52	-20** = 7	18.0	126
9	-3** = 1	86.0	86
Multiple Dependent			

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$ 212.00

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity, Small Entity

Fee Code (\$)	Fee Code (\$)	Fee Description	Fee Paid
1051 130	2051 65	Surcharge - late filing fee or oath	
1052 50	2052 25	Surcharge - late provisional filing fee or cover sheet	
1053 130	1053 130	Non-English specification	
1812 2,520	1812 2,520	For filing a request for ex parte reexamination	
1804 920*	1804 920*	Requesting publication of SIR prior to Examiner action	
1805 1,840*	1805 1,840*	Requesting publication of SIR after Examiner action	
1251 110	2251 55	Extension for reply within first month	110.0
1252 420	2252 210	Extension for reply within second month	
1253 950	2253 475	Extension for reply within third month	
1254 1,480	2254 740	Extension for reply within fourth month	
1255 2,010	2255 1,005	Extension for reply within fifth month	
1401 330	2401 165	Notice of Appeal	
1402 330	2402 165	Filing a brief in support of an appeal	
1403 290	2403 145	Request for oral hearing	
1451 1,510	1451 1,510	Petition to institute a public use proceeding	
1452 110	2452 55	Petition to revive - unavoidable	
1453 1,330	2453 665	Petition to revive - unintentional	
1501 1,330	2501 665	Utility issue fee (or reissue)	
1502 480	2502 240	Design issue fee	
1503 640	2503 320	Plant issue fee	
1460 130	1460 130	Petitions to the Commissioner	
1807 50	1807 50	Processing fee under 37 CFR 1.17(q)	
1806 180	1806 180	Submission of Information Disclosure Stmt	180.0
8021 40	8021 40	Recording each patent assignment per property (times number of properties)	
1809 770	2809 385	Filing a submission after final rejection (37 CFR 1.129(a))	
1810 770	2810 385	For each additional invention to be examined (37 CFR 1.129(b))	
1801 770	2801 385	Request for Continued Examination (RCE)	
1802 900	1802 900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 290.00

## SUBMITTED BY

(Complete if applicable)

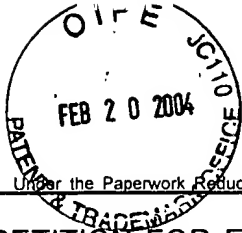
Name (Print/Type)	James D. Shaurette	Registration No. (Attorney/Agent)	39,833	Telephone	509-624-4276
Signature		Date	11/10/03		

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS.  
SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

If you need assistance in completing the form, call 1-800-PTO-9199 and select option 2.





PETITION FOR EXTENSION OF TIME UNDER 37 CFR 1.136(a)

Docket Number (Optional)

MI22-1663

In re Application of Scott E. Moore et al.

Application Number

09/814,260

Filed

3/21/2001

For Semiconductor Workpiece Processing Methods, A Method of Preparing Semiconductor Workpiece.

Group Art Unit

3724

Examiner

T. Eley

This is a request under the provisions of 37 CFR 1.136(a) to extend the period for filing a reply in the above identified application.

The requested extension and appropriate non-small-entity fee are as follows (check time period desired):

☒ One month (37 CFR 1.17(a)(1))

\$ 110.00

☐ Two months (37 CFR 1.17(a)(2))

\$

☐ Three months (37 CFR 1.17(a)(3))

\$

☐ Four months (37 CFR 1.17(a)(4))

\$

☐ Five months (37 CFR 1.17(a)(5))

\$

EL979954615

☐ Applicant claims small entity status. See 37 CFR 1.27. Therefore, the fee amount shown above is reduced by one-half, and the resulting fee is: \$

☐ A check in the amount of the fee is enclosed.

☐ Payment by credit card. Form PTO-2038 is attached.

☒ The Commissioner has already been authorized to charge fees in this application to a Deposit Account.

☒ The Commissioner is hereby authorized to charge any deficiencies or credit any overpayment, to Deposit Account Number 23-0925.

I have enclosed a duplicate copy of this sheet.

I am the ☐ assignee of record of the entire interest.

☐ applicant.

☐ attorney or agent of record.

☒ attorney or agent under 37 CFR 1.34(a).

Registration number if acting under 37 CFR 1.34(a) 39,833

**WARNING:** Information on this form may become public. Credit card information should not be included on this form. Provide credit card information and authorization on PTO-2038.

11/10/2003

Date

11/10/03

Signature

James D. Shaurette

Typed or printed name



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. .... 09/814,260  
Filing Date .... March 21, 2001  
Inventor .... Scott E. Moore et al.  
Assignee .... Micron Technology, Inc.  
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Customer No. .... 021567  
Attorney's Docket No. .... MI22-2439  
Title: Semiconductor Workpiece Processing Methods, A Method of Preparing  
Semiconductor Workpiece Process Fluid, and A Method of Delivering  
Semiconductor Workpiece Process Fluid to a Semiconductor Processor

RESPONSE TO JULY 10, 2003 OFFICE ACTION

To: Mail Stop Fee Amendment  
Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450

**EL979954615**

From: James D. Shaurette (Tel. 509-624-4276; Fax 509-838-3424)  
Wells, St. John, P.S.  
601 W. First Avenue, Suite 1300  
Spokane, WA 99201-3828

Sir:

Responsive to the Office Action dated July 10, 2003, Applicant amends and remarks  
as follows:

AMENDMENTS

### **In the Specification**

At p. 1 before the "Technical Field" section, please replace both Related Patent Data paragraphs with the following:

#### **--RELATED PATENT DATA**

This patent resulted from a divisional application of and claims priority to U.S. Patent Application Serial No. 09/517,127, filed March 2, 2000, entitled "Semiconductor Processing Systems, and A System Configured to Provide a Semiconductor Workpiece", naming Scott E. Moore et al. as inventors, which is a continuation in part of U.S. Patent Application Serial No. 09/324,737, filed June 3, 1999, entitled "Semiconductor Processors, Sensors, and Semiconductor Processing Systems", naming Scott E. Moore et al. as inventors, now U.S. Patent No. 6,290,576 B1, the disclosures of which are incorporated by reference.--

## **In the Claims**

Claims 1-67 are canceled..

68. [Currently Amended] A semiconductor workpiece processing method comprising:

providing a semiconductor processor system having a process chamber adapted to process a semiconductor workpiece;

processing the semiconductor workpiece within the process chamber using a process fluid;

monitoring the process fluid; and

controlling at least one operation of the semiconductor processor system responsive to the monitoring; and

wherein the monitoring comprises monitoring turbidity of the process fluid.

69. [Original] The method according to claim 68 further comprising providing a sample of the process fluid and the monitoring comprises monitoring the sample.

70. [Original] The method according to claim 69 further comprising providing the sample of the process fluid in a substantially static state and the monitoring comprises monitoring the process fluid in the substantially static state.

71. [Original] The method according to claim 69 wherein the monitoring comprises comparing the sample of the process fluid with a signature.

72. [Original] The method according to claim 68 further comprising flushing a connection configured to transport the process fluid and the controlling comprises controlling the flushing.

73. Cancel.

74. [Original] The method according to claim 68 further comprising supplying the process fluid to the process chamber and the monitoring is during the supplying.

75. [Original] The method according to claim 68 further comprising draining the process fluid from the process chamber and the monitoring is during the draining.

76. [Original] The method according to claim 68 wherein the processing comprises processing using a pad, and further comprising extracting process fluid from the pad during the processing and the monitoring comprises monitoring the process fluid after the extracting.

77. [Original] The method according to claim 68 further comprising transporting the process fluid relative to the process chamber using a connection and the monitoring comprises monitoring accumulation of particulate matter within the connection.

78. [Original] The method according to claim 68 further comprising:  
receiving a start-up command of the semiconductor processor system; and  
priming a connection configured to transport the process fluid using a flush fluid responsive to the receiving.

79. [Original] The method according to claim 78 wherein the priming comprises priming with flush fluid comprising the process fluid.

80. [Currently Amended] The method according to claim 78 wherein the monitoring comprises monitoring the turbidity of the flush fluid during the priming and the controlling comprises controlling the priming.

81. [Original] The method according to claim 68 further comprising:  
receiving a halt command of the semiconductor processor system; and  
flushing a connection configured to transport the process fluid responsive to the receiving.

82. [Original] The method according to claim 81 wherein the flushing comprises flushing with flush fluid comprising a rinse fluid.

83. [Currently Amended] The method according to claim 81 wherein the monitoring comprises monitoring the turbidity of the flush fluid during the flushing and the controlling comprises controlling the flushing.

84. [Original] The method according to claim 68 further comprising mixing plural components to provide the process fluid and the controlling comprises controlling the mixing.

85. [Original] The method according to claim 68 further comprising storing historical data of the process fluid after the monitoring.

86. [Original] The method according to claim 68 wherein the processing comprises chemical-mechanical polishing the semiconductor workpiece.

87. [Original] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system adapted to process a semiconductor workpiece using a process fluid;  
providing a sample of the process fluid;  
providing the sample of the process fluid in a substantially static state;  
monitoring the sample of the process fluid; and  
controlling an operation of the semiconductor processor system responsive to the monitoring.

88. [Original] The method according to claim 87 wherein the monitoring comprises monitoring the turbidity of the sample of the process fluid.

89. [Original] The method according to claim 87 wherein the monitoring comprises monitoring differential turbidity of the sample of the process fluid.

90. [Original] The method according to claim 89 wherein the monitoring comprises monitoring differential turbidity with respect to different moments in time.

91. [Original] The method according to claim 87 wherein the monitoring comprises comparing the sample of the process fluid with a signature.

92. [Original] The method according to claim 87 wherein the controlling comprises controlling a flush system to at least one of prime and rinse a connection configured to transport the process fluid.

93. [Original] The method according to claim 87 wherein the controlling comprises controlling a recirculation system to recirculate the process fluid.

94. [Original] The method according to claim 87 further comprising monitoring an operation of the semiconductor processor system and the providing the sample comprises providing the sample during defined operations of the semiconductor processor system.

95. [Original] The method according to claim 87 further comprising storing historical data of the process fluid after the monitoring.



Claims 96-102 are canceled.

103. [Original] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system adapted to process a semiconductor workpiece using a process fluid;  
transporting the process fluid relative to the semiconductor processor system;  
monitoring the process fluid; and  
recirculating the process fluid after the monitoring.

104. [Original] The method according to claim 103 wherein the monitoring comprises monitoring turbidity of the process fluid.

105. [Original] The method according to claim 103 further comprising supplying the process fluid to a process chamber of the semiconductor processor system after the recirculating.

106. [Original] The method according to claim 103 further comprising controlling the recirculating responsive to the monitoring.

Claims 107-117 are canceled.

118. [Original] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system adapted to process a semiconductor workpiece using a process fluid;  
transporting the process fluid relative to the semiconductor processor system using a connection;  
monitoring accumulation of particulate matter within the connection; and  
controlling at least one operation of the semiconductor processor system responsive to the monitoring.

119. [Original] The method according to claim 118 wherein the transporting comprises transporting using a substantially horizontal connection.

120. [Original] The method according to claim 119 wherein the monitoring comprises monitoring in a substantially vertical direction.

121. [Original] The method according to claim 118 wherein the monitoring comprises monitoring turbidity.

122. [Original] The method according to claim 118 wherein the controlling comprises controlling a flushing operation of the connection responsive to the monitoring.

123. [Original] The method according to claim 118 wherein the controlling comprises controlling a recirculating operation of the connection responsive to the monitoring.

124. [Original] The method according to claim 118 wherein the transporting comprises supplying process fluid to a process chamber of the semiconductor processor system.

125. [Original] The method according to claim 118 wherein the transporting comprises draining process fluid from a process chamber of the semiconductor processor system.

126. [Original] A method of delivering semiconductor workpiece process fluid to a semiconductor processor comprising:

providing semiconductor workpiece process fluid;

transporting the semiconductor workpiece process fluid relative to a semiconductor processor; and

monitoring the semiconductor workpiece process fluid.

127. [Original] The method according to claim 126 wherein the monitoring comprises monitoring turbidity of the semiconductor workpiece process fluid.

128. [Original] The method according to claim 126 wherein the monitoring comprises comparing the semiconductor workpiece process fluid with a signature.

129. [Original] The method according to claim 126 wherein the providing comprises mixing a plurality of components of the semiconductor workpiece process fluid, and further comprising controlling the mixing responsive to the monitoring.

130. [New] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system having a process chamber adapted to process a semiconductor workpiece;  
processing the semiconductor workpiece within the process chamber using a process fluid;  
monitoring the process fluid;  
controlling at least one operation of the semiconductor processor system responsive to the monitoring; and  
flushing a connection configured to transport the process fluid, and the controlling comprises controlling the flushing.

131. [New] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system having a process chamber adapted to process a semiconductor workpiece;  
processing the semiconductor workpiece within the process chamber using a process fluid;

monitoring the process fluid;  
controlling at least one operation of the semiconductor processor system responsive to the monitoring; and  
transporting the process fluid relative to the process chamber using a connection and the monitoring comprises monitoring accumulation of particulate matter within the connection

132. [New] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system having a process chamber adapted to process a semiconductor workpiece;  
processing the semiconductor workpiece within the process chamber using a process fluid;  
monitoring the process fluid;  
controlling at least one operation of the semiconductor processor system responsive to the monitoring;  
receiving a start-up command of the semiconductor processor system; and  
priming a connection configured to transport the process fluid using a flush fluid responsive to the receiving.

133. [New] The method according to 132 wherein the priming comprises priming with flush fluid comprising the process fluid.

134. [New] The method according to 132 wherein the monitoring comprises monitoring turbidity of the flush fluid during the priming and the controlling comprises controlling the priming.

135. [New] A semiconductor workpiece processing method comprising:  
providing a semiconductor processor system having a process chamber adapted to process a semiconductor workpiece;  
processing the semiconductor workpiece within the process chamber using a process fluid;  
monitoring the process fluid;  
controlling at least one operation of the semiconductor processor system responsive to the monitoring;  
receiving a halt command of the semiconductor processor system; and  
flushing a connection configured to transport the process fluid responsive to the receiving.

136. [New] The method according to 135 wherein the flushing comprises flushing with flush fluid comprising a rinse fluid.

137. [New] The method according to 135 wherein the monitoring comprises monitoring turbidity of the flush fluid during the flushing and the controlling comprises controlling the flushing.

138. [New] The method according to claim 87 wherein the providing the sample comprises controlling extraction of the sample of the process fluid from a distributor configured to provide the process fluid.

### REMARKS

Applicants appreciate the indication that claims 72-73, 77-83, 88-90, 104-106, 118-125, and 127 recite allowable subject matter.

Applicants hereby add new claims 130-138 and cancel claim 73. Accordingly, claims 68-72 and 74-95, 103-106 and 118-137 are pending in the present application.

Claim 92 stands rejected under 35 USC 112, second paragraph, for indefiniteness. Claims 103, 126, and 128-129 stand rejected under 35 USC 102(a) for anticipation by U.S. Patent No. 6,183,352 to Kurisawa. Claims 68-69, 76, 84-86, and 105 stand rejected under 35 USC 103(a) for obviousness over Kurisawa. Claims 68-71, 74-76, 85-87, 91, 94, and 95 stand rejected under 35 USC 103(a) for obviousness over U.S. Patent No. 5,718,620 to Tanaka et al. Claim 93 stands rejected under 35 USC 103(a) for obviousness over Tanaka et al. in view of Kurisawa.

Claim 68 has been amended to include the limitations of claim 73 indicated to be allowable. Applicants submit claim 68 is allowable.

The claims which depend from independent claim 68 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Independent claim 87 stands rejected over Tanaka. Applicants disagree with the rejection. In particular, page 4 of the Office Action recites teachings of Tanaka which allegedly disclose limitations of claim 87. However, the identified teachings fails to disclose or suggestion the claimed limitations. For example, claim 87 recites *providing a sample of a process fluid, providing the sample of the process fluid in a substantially static state*.



and monitoring the sample of the process fluid. The limitations of claim 87 are not shown nor suggested by the prior art.

Tanaka teaches an abrasive compound tank 13 receives abrasive compound 9 that flows radially outwardly on the reference table 2 and falls off the outer circumferential edge thereof (col. 6, lines 1-13). The tank 13 stores the compound until the compound is pumped back to nozzle 10 for reuse. The teachings in col. 6 recite monitoring temperature of an entirety of compound 9 within the storage tank 13 as set forth in col. 6, lines 17-27 to maintain the entirety of the compound 9 at a predetermined temperature in the tank 13. With the aim to provide the temperature of the compound 9 at the predetermined temperature, Tanaka is clearly directed towards monitoring of temperature of an entirety of the compound fluid in the tank 13. Tanaka is not concerned with monitoring a sample as claimed inasmuch as Tanaka clearly is directed towards monitoring temperature of an entirety of the compound 9 stored in tank 13 to provide results of increased accuracy.

An exemplary definition of sample is provided as a small segment or quantity taken as evidence of the quality or character of the entire group or lot (Webster's Third New International Dictionary, Copyright 1976, vol. III, page 2008). Tanaka fails to disclose or suggest the claimed providing of the **sample**, providing the sample in a **substantially static state** or **monitoring the sample** of the process fluid. Tanaka teaches monitoring an entirety of temperature of the compound in tank 13 as opposed to providing the claimed sample. Further, the entry of new compound into tank 13 and suction of compound 9 from tank 13 using pump 21 would preclude provision of the sample in a substantially static state as claimed. Finally, the monitoring of temperature of an entirety of the compound in

tank 13 of Tanaka fails to teach or suggest monitoring the sample as claimed. Numerous limitations of claim 87 are not shown nor suggested by the prior art and claim 87 is allowable.

The claims which depend from independent claim 87 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Independent claim 103 was rejected over Kurisawa during the prosecution of the '260 application. Kurisawa does not qualify as prior art. In particular, Kurisawa was filed in the U.S. on August 25, 1999 claiming priority from a Japanese application filed August 28, 1998 and published March 7, 2000. The present application claims priority from serial no. 09/517,127, filed March 2, 2000, which was a continuation-in-part of serial no. 09/324,737, filed June 3, 1999, now U.S. Patent No. 6,290,576 B1. Claim 103 is supported by Figs. 1-11 and associated specification teachings of the present application which comprise subject matter disclosed in the 09/517,127 and 09/324,737 applications. Applicants request withdrawal of the rejection of claim 103 over the prior art and allowance of claim 103 in the next Action.

The claims which depend from independent claim 103 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Independent claim 126 stands rejected over Kurisawa. Kurisawa does not qualify as prior art. Claim 126 is supported by Figs. 1-11 and associated specification teachings of the present application which comprise subject matter disclosed in the 09/517,127 and

09/324,737 applications. Applicants request withdrawal of the rejection of claim 126 over the prior art and allowance of claim 126 in the next Action.

The claims which depend from independent claim 126 are in condition for allowance for the reasons discussed above with respect to the independent claim as well as for their own respective features which are neither shown nor suggested by the cited art.

Claim 92 stands rejected for alleged indefiniteness. The Office Action alleges the claim is awkwardly worded. Applicants submit the claim is understood and definite to one of skill in the art, and accordingly, the 112, second paragraph rejection is improper. Applicants request allowance of claim 92 or further clarification of the allegedly indefinite language of claim 92 in a non-Final Action if the rejection is maintained.

New claim 130 includes limitations of claim 68 and claim 72. Claim 130 is believed to be allowable in view of the indication of the Office Action that claim 72 was allowable.

New claim 131 includes limitations of claim 68 and claim 77. Claim 131 is believed to be allowable in view of the indication of the Office Action that claim 77 was allowable.

New claim 132 includes limitations of claim 68 and claim 78. Claim 132 is believed to be allowable in view of the indication of the Office Action that claim 78 was allowable.

New claim 135 includes limitations of claim 68 and claim 81. Claim 135 is believed to be allowable in view of the indication of the Office Action that claim 81 was allowable.

Support for new claim 138 may be found at least at Figs. 1-3 and associated specification teachings of the originally filed application.

Applicants submit an Information Disclosure Statement herewith.

Applicants request allowance of all pending claims.

The Examiner is requested to phone the undersigned if the Examiner believes such would facilitate prosecution of the present application. The undersigned is available for telephone consultation at any time during normal business hours (Pacific Time Zone).

Respectfully submitted,

Dated: \_\_\_\_\_

11/10/03

By: \_\_\_\_\_



James D. Shaurette  
Reg. No. 39,833



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application Serial No. .... 09/814,260  
Filing Date ..... March 21, 2001  
Inventor ..... Scott E. Moore et al.  
Assignee ..... Micron Technology, Inc.  
Group Art Unit ..... 3724  
Examiner ..... T. Eley  
Customer No. .... 021567  
Attorney's Docket No. .... MI22-2439  
Title: "Semiconductor Workpiece Processing Methods and Methods of Delivering  
Semiconductor Workpiece Process Fluid to a Semiconductor Processor"

**SUPPLEMENTAL INFORMATION DISCLOSURE STATEMENT**

References -- See Attached Form PTO-1449


The attached form PTO-1449 is submitted in compliance with 37 CFR §1.56. No admission is made regarding whether all the submitted references are prior art.

EL979954615

Respectfully submitted,

Dated: 11/10/03

Attorney:

  
James D. Shaurette  
Reg. No. 39,833

Form PTO-144 <div style="border: 2px solid black; border-radius: 50%; padding: 10px; display: inline-block; transform: rotate(-45deg); transform-origin: center;">           OFFICE OF            PATENT &amp; TRADEMARK            FEB 20 2004         </div>		U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE		ATTY. DOCKET NO. M122-1663		SERIAL NO. 09/814,260	
LIST OF ART CITED BY APPLICANT (Use several sheets if necessary)				APPLICANT Scott E. Moore et al.		FILING DATE March 21, 2001	
GROUP 3723							

U.S. PATENT DOCUMENTS							
*Examiner Initial	Document Number	Date	Name	Class	Subclass	Filing Date If Appropriate	
	AA	5,923,433	7/13/1999	Giuffre et al.			
	AB						
	AC						
	AD						
	AE						
	AF						
	AG						
	AH						
	AI						
	AJ						
	AK						
	AL						

FOREIGN PATENT DOCUMENTS							
	Document Number	Date	Country	Class	Subclass	Translation	
						Yes	No
	AM						
	AN						
	AO						
	AP						
	AQ						

OTHER REFERENCES (including Author, Title, Date, Pertinent Pages, Etc.)			
	AR		
	AS		
	AT		

EXAMINER	DATE CONSIDERED
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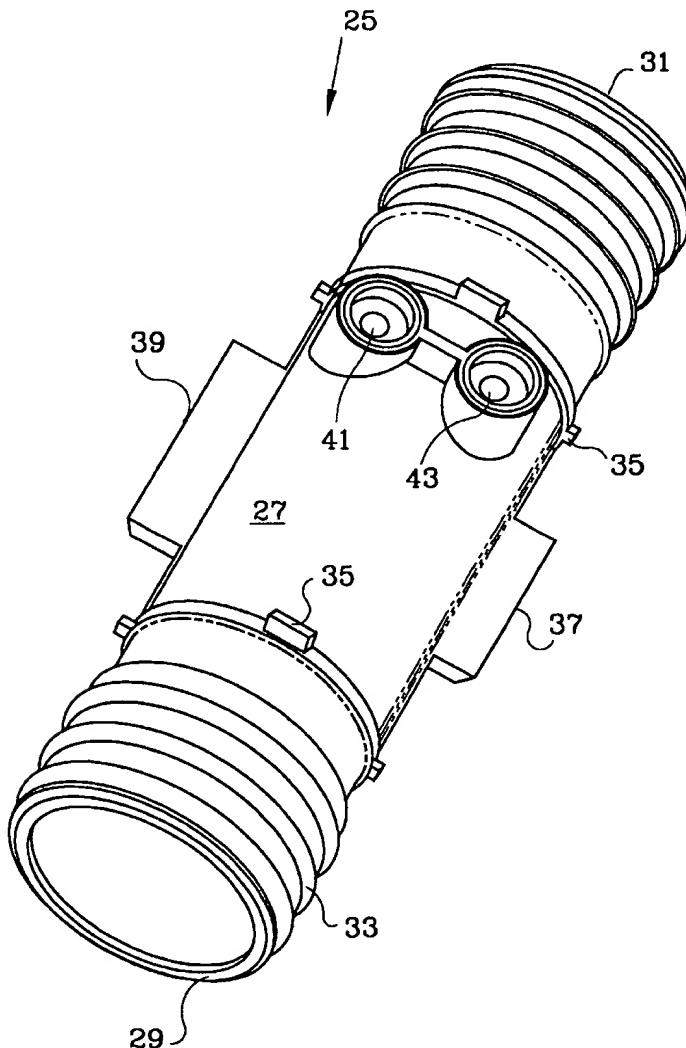
\*EXAMINER: Initial if reference considered, whether or not citation is in conformance with MPEP 609: Draw line through citation if not in conformance and not considered. Include copy of this form with next communication to applicant.



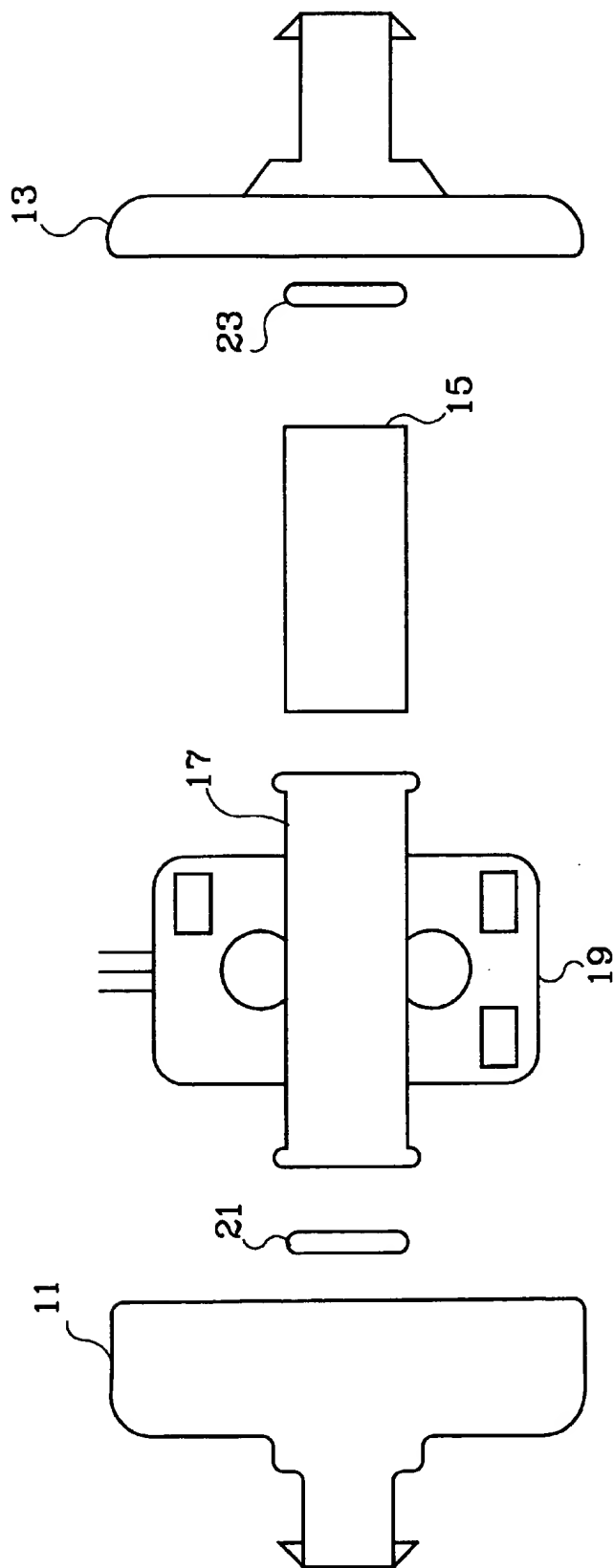
US005923433A

**United States Patent** [19][11] **Patent Number:** **5,923,433****Giuffre et al.**[45] **Date of Patent:** **Jul. 13, 1999**[54] **OVERMOLDED FLOWTHROUGH  
TURBIDITY SENSOR**[56] **References Cited****U.S. PATENT DOCUMENTS**[75] **Inventors:** **Thomas R. Giuffre**, Freeport; **Bruce B. Figi**, Rockford; **Sharadkumar D. Patel**; **Thomas M. Moyer**, both of Freeport, all of Ill.5,291,626 3/1994 Molnar et al. .... 68/12.02  
5,446,531 8/1995 Boyer et al. .... 356/72[73] **Assignee:** **Honeywell Inc.**, Minneapolis, Minn.*Primary Examiner*—Robert H. Kim  
*Assistant Examiner*—Amanda Merlino  
*Attorney, Agent, or Firm*—Roland W. Norris[21] **Appl. No.:** **08/959,412**[57] **ABSTRACT**[22] **Filed:** **Oct. 28, 1997**

A flow-through visible-light turbidity sensor is constructed from a molded plastic flow tube with an overmolded opaque housing to shield the optical sensing apparatus from ambient light. The housing also secures and covers all electronics for the sensor. The molded parts provide lower cost and less dimensional variation for the sensor as well as the ability to locate conductivity or other physical probe sensor types within the package.

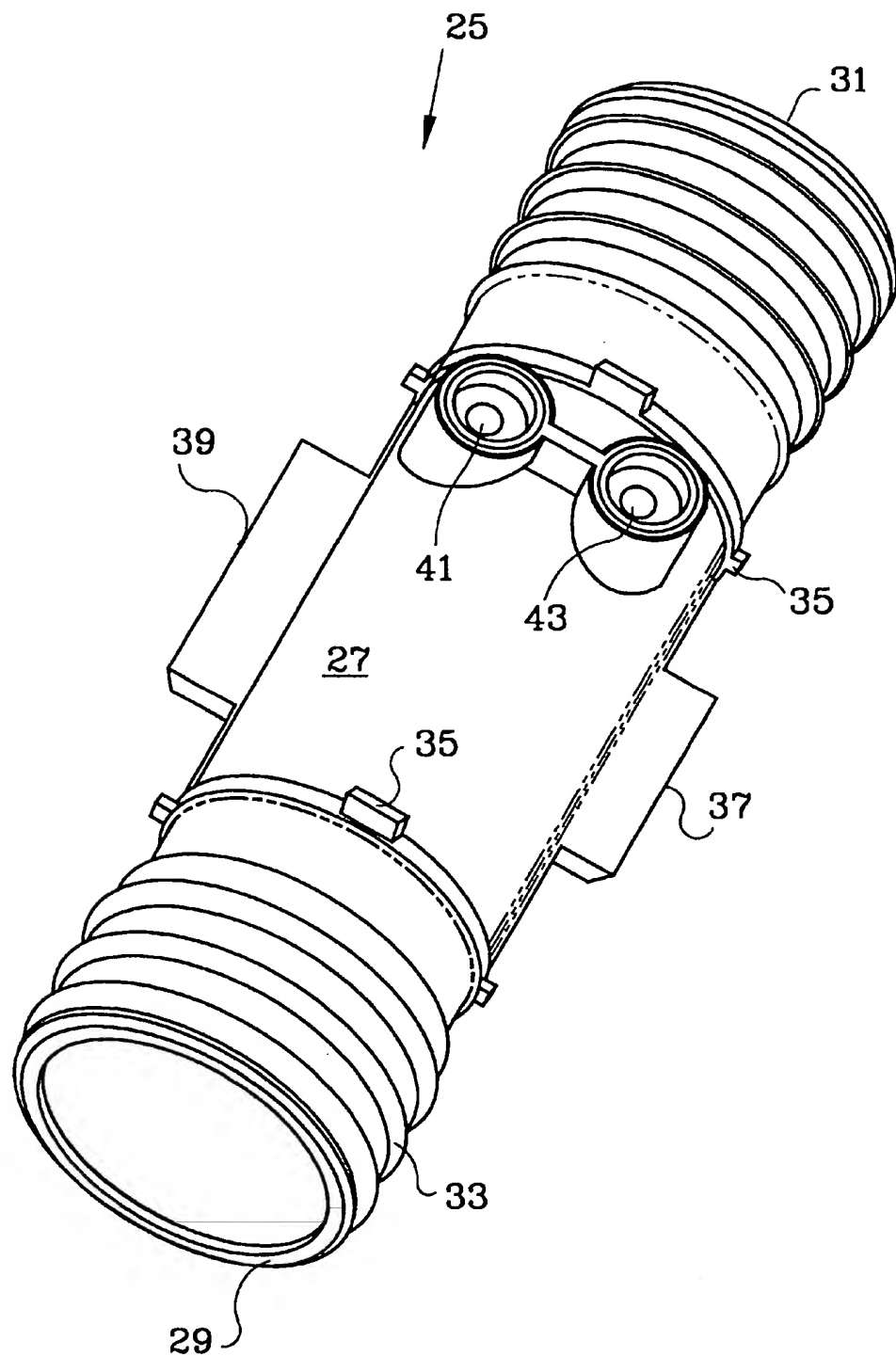
[51] **Int. Cl.<sup>6</sup>** ..... **G01N 21/00; G01N 1/10**[52] **U.S. Cl.** ..... **356/440; 356/246**[58] **Field of Search** ..... 356/246, 436,  
356/440-442; 68/12.02**10 Claims, 4 Drawing Sheets**

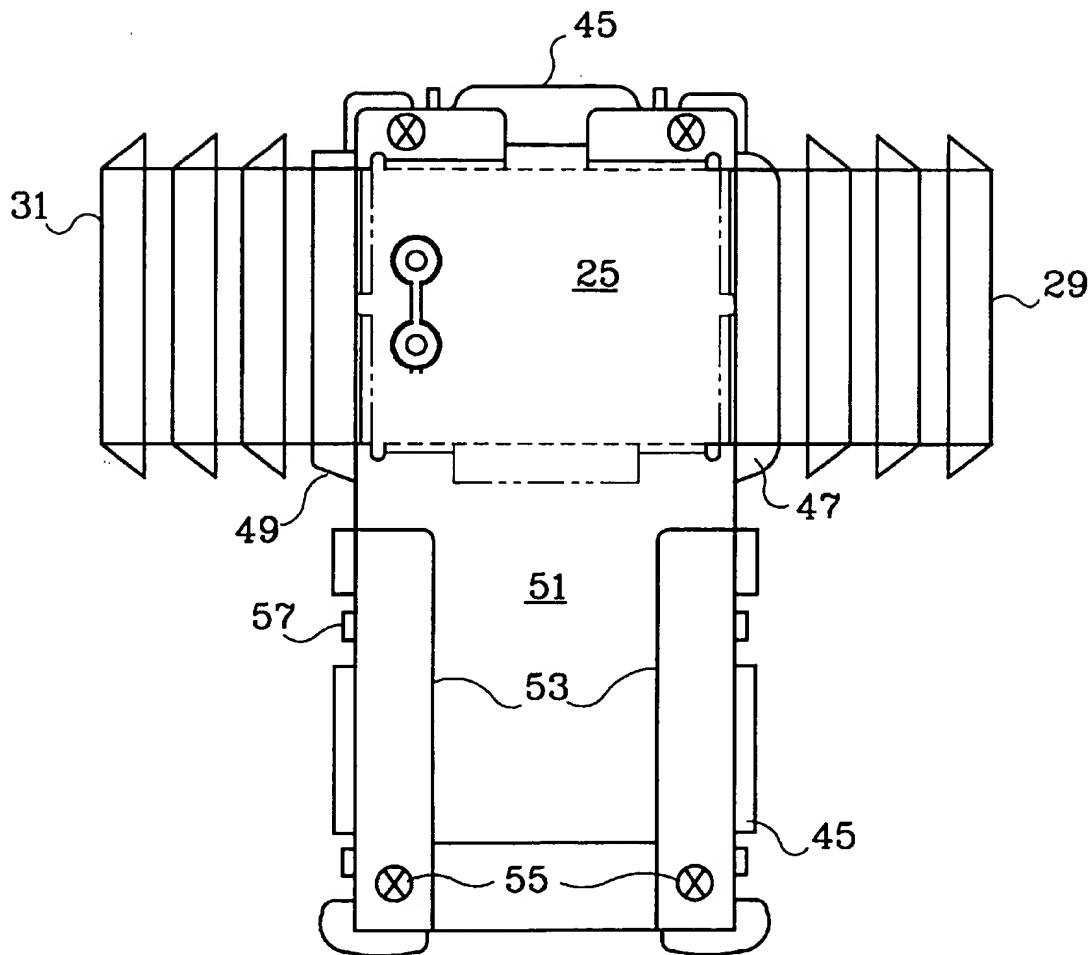
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*Fig. 1*  
(PRIOR ART)

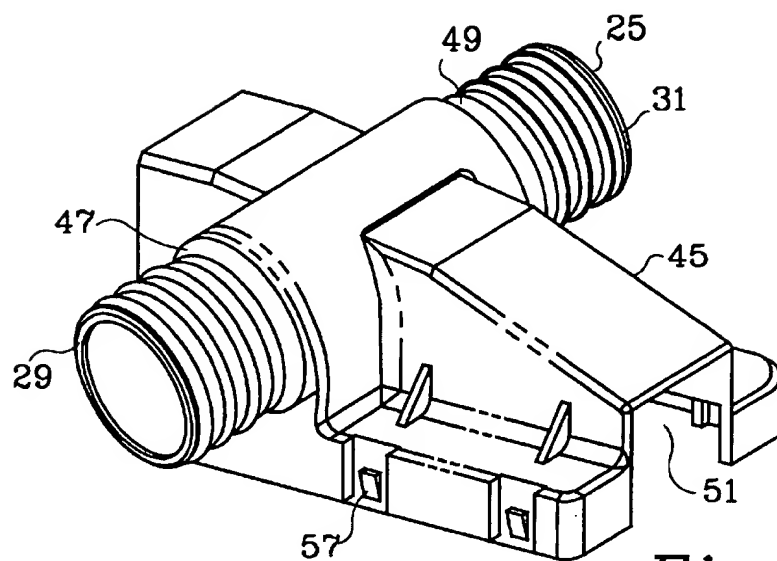


*Fig. 2*

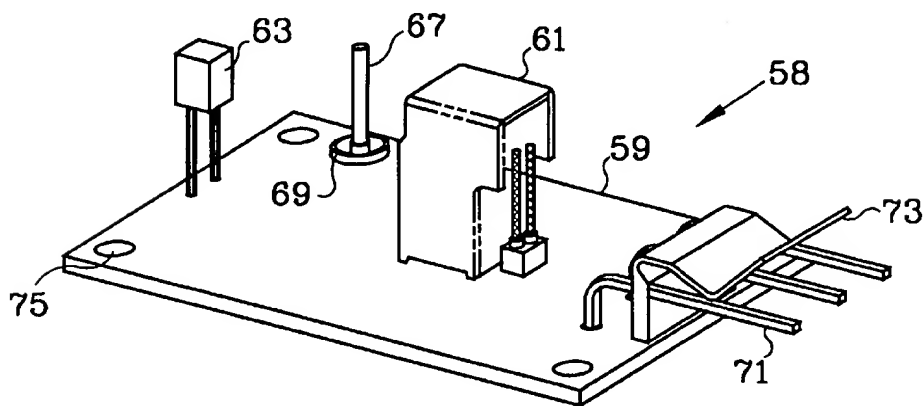


TOP VIEW

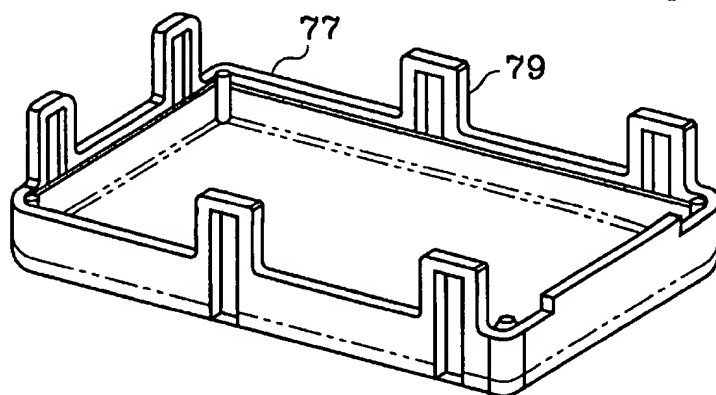
*Fig. 3*



*Fig. 4*



*Fig. 5*



*Fig. 6*

## OVERMOLDED FLOWTHROUGH TURBIDITY SENSOR

### BACKGROUND OF THE INVENTION

#### 1. Field of the Invention

The present invention generally relates to turbidity sensors. The present invention more particularly relates to a turbidity sensor with a tube through which the sensed media/liquid flows and which utilizes light for sensing the turbidity; and which may further contain conductivity sensors or the like for the sensed media.

#### 2. Description of the Prior Art

Turbidity sensors utilizing light to sense the amount of particulates in a solution are known in the art. Reference may be had to U.S. Pat. No. 5,446,531 to Boyer et al. for background discussion of the related art as it might particularly apply to a fluid condition sensor which is placed in, or surrounded by, the liquid or media to be sensed.

Reference may also be had to U.S. Pat. No. 5,291,626 to Molnar et al. for discussion of a turbidity sensor of the visible light, or optical, variety in which the liquid to be sensed flows through a clear tube surrounded by the optical sensing components.

As seen in FIG. 1, a visible light flowthrough turbidity sensor, as currently known, utilizes a casing having first and second halves 11 and 13, respectively, which are opaque and which totally surround a quartz glass media tube 15 which is inserted through an opaque tube 17 contained on a PCB assembly 19 which contains the optical and electronic components required for the output of a turbidity signal. O-rings 21 and 23 are used at each end of the quartz glass media tube 15 to prevent ambient light from leaking into, and the sensed media from leaking out of the media tube.

However, this known arrangement, as seen in FIG. 1, has several disadvantages. First, related to the quartz glass media tube, the glass is expensive, brittle, and is subject to wide dimensional variations among different tubes due to inherent manufacturing tolerances. Therefore, the O-rings are made oversized so that they may account for the size variations within one or several runs of glass tube manufacture. Expense and breakability of the glass are obvious shortcomings in a manufacturing environment. Further, it is very difficult to insert additional probes through the glass wall of the tube in order to contact the media physically. Such probes as temperature or conductivity probes are therefore not easily integrated into this package. Further, anywhere there is an O-ring there is a potential failure point.

It is therefore an object of the present invention to provide a turbidity sensor which overcomes the cited difficulties of the known art and provides for a lower cost turbidity sensor package with additional design freedom for multiple sensing apparatus and which has a lower cost and fewer parts than the known visible light flowthrough turbidity sensor packages.

### SUMMARY OF THE INVENTION

The preferred embodiment of the present invention has four basic parts as opposed to the prior art six parts. A molded optically clear media tube for passing the media to be sensed is overmolded with the first half of a sensor casing to seal off light from the tube at two spaced, circumferential areas. The sensor casing is opaque to prevent the entrance of ambient, or noise, light which would interfere with the visible light sensing during turbidity determination operations. The overmolded casing has a void therein for con-

taining within its walls the optical and/or electronic components necessary for sensor operation and output, and for placement of the sensing components around the clear media tube. An opaque casing cover is then mated over the sensing components package to the overmolded casing half to provide a light proof seal over substantially all the sensor package.

Alternatively, dependent on the sensor component desired and molding techniques availed, other constructions and arrangements of the apparatus could be made for effective light sealing of the sensor package. The advantages of the present embodiment include fewer parts, easier construction and assembly, and less expensive parts which are easier to handle and less capable of breaking.

These and other advantages will be more thoroughly realized in connection with the below provided description of the preferred embodiment in conjunction with the accompanying drawings of which like parts are identified by like reference numerals throughout.

### BRIEF DESCRIPTION OF THE DRAWINGS

The present invention will be more fully and completely understood from a reading of the Description of the Preferred Embodiment in conjunction with the drawings, in which:

FIG. 1 is an exploded view of a known visible light flowthrough turbidity sensor from the prior art.

FIG. 2 is a top perspective view of a molded tube according to the preferred embodiment of the present invention.

FIGS. 3 and 4 are top and bottom views of the overmolded casing showing the flow tube therein, respectively.

FIG. 5 is a view of a PC board representing the sensing components package of optical and physical sensing apparatus contained within the sensor package.

FIG. 6 is a view of the top of the opaque casing cover mateable with the overmolded casing, to complete the ambient light impervious sensor package according to a preferred embodiment of the present invention.

### DESCRIPTION OF THE PREFERRED EMBODIMENT

As seen in FIG. 2, a molded flowtube 25 is constructed and arranged to pass liquid media therethrough for turbidity and other media characteristic sensing as deemed necessary by the application to which the sensor is put. The flowtube 25 has a central optically clear, i.e. transmissive to the electromagnetic radiation used to sense turbidity, portion 27 which extends circumferentially approximately two thirds of the way around the tube for the transmission and reception of light therethrough. The area of the window may vary according to the optical turbidity sensor requirements of any particular embodiment. Portions of the tube 25 may be made translucent rather than clear depending on the degree of light transmission required. The illustrated embodiment is noted to be a visible light sensor, so the mold for the tube 25 is polished to produce the clear central window 27.

First and second end portions 29 and 31, respectively, are on opposing sides of the axially central window portion 27 and are ridged as at reference numeral 33 in order to accept and secure media transmission lines such as hoses or the like to the flow tube 25. Radial attachment tabs, collectively 35, are provided at the shoulder borders between the end pieces 29, 31 and the central window portion 27. The attachment tabs 35 will be secured to the overmolded

opaque casing, as described below, helping to affix and positionally secure the flow tube 25 to the casing. First and second sensor tube tabs, 37 and 39 respectively extend outward from the tube wall at the bottom of the window portion 27. The sensor tube tabs 37 and 39 provide positioning means for the optical sensing apparatus which abut thereto as further explained below.

As further seen in FIG. 2, the preferred embodiment of flow tube 25 has molded therein throughholes 41, 43 for supporting physical characteristic sensing probes, such as temperature or conductivity probes, which need to pass through the tube wall to touch the media flowing therethrough in the interior of the flow tube. Through holes 41, 43 are constructed and arranged to accommodate probes as well as liquid sealing devices such as O-rings or the like as further explained below. The bottom portion of the flow tube 25 may be left translucent rather than clear to minimize mold polishing costs.

The tube 25 is composed of an optically clear plastic or like material which is moldable into the form desired. Particular compositions of the tube may be dictated by different optical or physical characteristics required for the sensing system or the media flowing through the tube and are considered within the ordinary skill of the art.

As seen in FIGS. 3 and 4, the overmolded casing 45 substantially surrounds the axially central clear window portion 27 of the tube 25. The overmolded casing 45 is made from an opaque plastic or other such material suitable for circumferentially surrounding the tube 25 at axial locations between the end portions 29, 31 and the clear window 27 of the tube. The molded surround creates extensions 47 and 49 extending from the main side wall of the casing 45. The casing 45 also noncircumferentially surrounds the bottom portion of the tube window section 27 and provides a void or central channel 51 providing room for a sensing components package PCB as further explained below. The extensions 47, 49, when abutted by hosing or other opaque media conduit carrying the media to be sensed, provide a light seal preventing unwanted ambient light from entering the end portions 29, 31 of the molded flow tube 25. The tube end portions could also be made opaque if additional protection against ambient light were desired.

As seen in FIG. 3, formed in the overmolded casing 45 are bosses 53 for the support of the sensing components package (FIG. 5) and capture posts 55 for engaging corresponding holes on the sensing component package for the positional and mechanical securement thereof.

On the outer wall of the overmolded casing 45 are formed protrusions 57 for accepting and retaining attachment loops formed in the top cover (FIG. 6).

The sensing components package 58 is seen in FIG. 5. The sensing components package 58 has a PC board 59 supporting a light emitter 61, a transmitted light detector 63 and additional physical probes 67 represented here by a conductivity probe surrounded at its base by an O-ring 69. The light emitter, in situ, abuts second sensor tube tab 39, while the light detector 63 abuts the first sensor tube tab 37. The physical probes 67 fit through through-holes 41 and 43 of the flow tube and are sealed by the O-rings 69 at their base. Other optical or physical sensors might be added as required. Additional electronic components necessary for sensor signal processing would typically be mounted on the PCB 59 but are not shown for the sake of simplicity. Input/output leads 71 provide external electric/electronic connection outside the sensor package. A spring clip 73 for attachment of outside cabling is further provided. Through-

holes 75 in the PC board 59 are provided for cooperative engagement with the capture posts 55 of the overmolded casing 45.

It will be appreciated that the present invention will allow a variety of different light, or electromagnetic radiation, sensors as well as physical sensors to be positioned on the sensor package 58 so as to surround or engage the flow tube in order to take a variety of different kinds of measurements on the media flowing therethrough.

FIG. 6 shows the top cover 77 which is used to seal the sensor package when the sensing components package is placed within the overmolded casing. The top cover 77 physically protects the sensor package and prevents additional transmission of ambient light to the visible light sensing area surrounding and including the clear window portion 27 of the flow tube 25. As shown, top cover 77 contains loops 79 extending therefrom to engage overmolded casing protrusions 57 for removable attachment of the top cover. It will of course be appreciated that the top cover may also be attached with adhesives or other suitable means. Alternatives may include molding the top cover to the sensor package or molding the sensor package into a one piece casing.

Thus there has been shown and described a visible light flow-through turbidity sensor having the advantages of low cost multiple sensor access and ease of assembly over those known in the prior art. While a particular embodiment has been shown and described it will of course be appreciated that many other embodiments are within the scope of the present invention as described by the appended claims.

The embodiments of the invention in which an exclusive property or right is claimed are defined as follows:

1. A flowthrough turbidity sensor comprising:

- a) a flow tube having a portion transmissive to a sensing electromagnetic radiation, and means for receiving and outputting a media to be sensed for turbidity;
- b) an opaque casing molded in place around the transmissive portion of the flow tube;
- c) an electromagnetic radiation source for emitting electromagnetic radiation through said tube, said source contained within said opaque casing;
- d) an electromagnetic radiation sensing element positioned to receive said emitted electromagnetic radiation, said element contained within said opaque casing, for outputting a signal based on the amount of electromagnetic radiation received from said electromagnetic radiation source;

whereby a fluid flowing through said flow tube may have its turbidity sensed by the amount of electromagnetic radiation received by said sensing element.

2. The turbidity sensor according to claim 1:

wherein the flow tube comprises a molded plastic tube.

3. The turbidity sensor according to claim 1:

wherein the electromagnetic radiation is visible light.

4. The turbidity sensor according to claim 1:

wherein the opaque casing contains a void for receiving said emitting source and said sensing element.

5. The turbidity sensor according to claim 4:

wherein the sensor further comprises a top cover mateable within said opaque casing for covering said void.

6. The turbidity sensor according to claim 1:

wherein the flow tube contains throughholes for the passage of physical contact sensing probes to the interior of said flow tube.

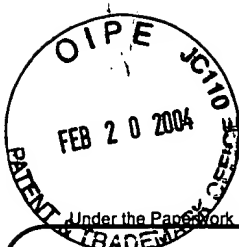
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7. A flow-through turbidity sensor comprising:
- a) a molded flow tube having first and second ends and a clear circumferential portion located between the first and second ends thereof, said ends being connectable to a conduit of a fluid to be sensed;
  - b) an opaque casing molded in place around the flow tube for substantially preventing ambient light from reaching said clear circumferential portion of said tube and having a void therein for containing sensing components for determining the turbidity of the fluid;
  - c) a sensing components package having light emitting and light receiving means contained within said opaque casing;
    - whereby the fluid to be sensed may have its turbidity determined according to the amount of light received by said receiving means after the light has passed through said tube between said light emitting and said light receiving means.
8. The turbidity sensor according to claim 7, wherein: the sensor further comprises a top cover mateable with said opaque casing for covering said void.
9. The turbidity sensor according to claim 7 wherein: the flow tube contains through-holes for the passage of physical contact sensing probes to the interior of said flow tube.
10. A visible-light flowthrough turbidity sensor comprising:
- a) a molded flow tube having an interior for passing a media to be sensed and having

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- 1) a central, optically clear portion,
- 2) two end portions for connection within a media transmission line,
- 3) attachment tabs for helping secure and position an overmolded casing thereto, and
- 4) a through-hole molded therein for receiving a sensor probe to the interior of said flow tube;
- b) an opaque casing molded to surround a noncircumferential part of said optically clear tube portion and at least a circumferential portion of said tube end portions, the casing having a void for containing sensing components therein and forming an optical sensing area and bosses for the mechanical placement and securing of the sensing components;
- c) an opaque casing cover for mating with said casing to help prevent ambient light from entering the optical sensing area;
- d) a sensing components package positionable in said opaque casing void and having light emitting and light receiving means positionable about said molded flow tube and other components necessary for generating a turbidity output signal; and
- e) wherein said flow tube, casing, casing cover and sensing package are constructed and arranged to make a sensor package substantially impervious to ambient light.

\* \* \* \* \*



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PTO/SB/21 (02-04)

Approved for use through 07/31/2006. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

<b>TRANSMITTAL FORM</b>  (to be used for all correspondence after initial filing)	Application Number	09/814,260	<b>RECEIVED</b>  <b>MAR 02 2004</b>  <b>OFFICE OF PETITIONS</b>
	Filing Date	March 21, 2001	
	First Named Inventor	Scott E. Moore et al.	
	Art Unit	3724	
	Examiner Name	T. Eley	
Total Number of Pages in This Submission	Attorney Docket Number	MI22-1663	

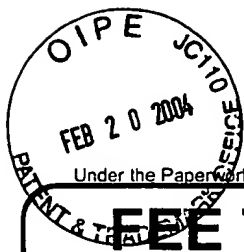
ENCLOSURES (Check all that apply)		
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<input checked="" type="checkbox"/> Fee Attached	<input type="checkbox"/> Licensing-related Papers	<input type="checkbox"/> Appeal Communication to Board of Appeals and Interferences
<input type="checkbox"/> Amendment/Reply	<input checked="" type="checkbox"/> Petition 37 CFR 1.137(a)	<input type="checkbox"/> Appeal Communication to TC (Appeal Notice, Brief, Reply Brief)
<input type="checkbox"/> After Final	<input type="checkbox"/> Petition to Convert to a Provisional Application	<input type="checkbox"/> Proprietary Information
<input type="checkbox"/> Affidavits/declaration(s)	<input type="checkbox"/> Power of Attorney, Revocation Change of Correspondence Address	<input type="checkbox"/> Status Letter
<input type="checkbox"/> Extension of Time Request	<input type="checkbox"/> Terminal Disclaimer	<input checked="" type="checkbox"/> Other Enclosure(s) (please identify below):
<input type="checkbox"/> Express Abandonment Request	<input type="checkbox"/> Request for Refund	Return Receipt Postcard; Copies of documents filed 11/10/2003; Statement Attesting to Transmission; A \$110.00 check.
<input type="checkbox"/> Information Disclosure Statement	<input type="checkbox"/> CD, Number of CD(s) _____	
<input type="checkbox"/> Certified Copy of Priority Document(s)	Remarks	Additional Enclosures:
<input type="checkbox"/> Response to Missing Parts/Incomplete Application		Copy of Auto-Reply Facsimile Transmission
<input type="checkbox"/> Response to Missing Parts under 37 CFR 1.52 or 1.53		Copy of Sending Unit's Report Confirming Transmission
		<b>EL979954615</b>

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT	
Firm or Individual name	James D. Shaurette, Reg. No. 39,833 Wells St. John, P.S.
Signature	
Date	2/18/04

CERTIFICATE OF TRANSMISSION/MAILING	
I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as <u>express</u> mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below.	
Typed or printed name	Trinity Coxon
Signature	
Date	2/20/04

This collection of information is required by 37 CFR 1.5. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to 2 hours to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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PTO/SB/17 (10-03)

Approved for use through 07/31/2006. OMB 0651-0032

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ ) 110.00

**Complete if Known**

Application Number	09/814,260
Filing Date	March 21, 2001
First Named Inventor	Scott E. Moore et al.
Examiner Name	T. Eley
Art Unit	3724
Attorney Docket No.	MI2282439

**METHOD OF PAYMENT (check all that apply)**☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None☒ Deposit Account:Deposit  
Account  
Number  
Deposit  
Account  
Name

23-0925

Wells St. John, P.S.

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments☒ Charge any additional fee(s) or any underpayment of fee(s)☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.**FEE CALCULATION (continued)****3. ADDITIONAL FEES**

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description
1051	130	2051	65	Surcharge - late filing fee or oath
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet
1053	130	1053	130	Non-English specification
1812	2,520	1812	2,520	Request for Continued Examination
1804	920*	1804	920*	Requesting publication of SIR prior to Examiner action
1805	1,840*	1805	1,840*	Requesting publication of SIR after Examiner action
1251	110	2251	55	Extension for reply within first month
1252	420	2252	210	Extension for reply within second month
1253	950	2253	475	Extension for reply within third month
1254	1,480	2254	740	Extension for reply within fourth month
1255	2,010	2255	1,005	Extension for reply within fifth month
1401	330	2401	165	Notice of Appeal
1402	330	2402	165	Filing a brief in support of an appeal
1403	290	2403	145	Request for oral hearing
1451	1,510	1451	1,510	Petition to institute a public use proceeding
1452	110	2452	55	Petition to revive - unavoidable
1453	1,330	2453	665	Petition to revive - unintentional
1501	1,330	2501	665	Utility issue fee (or reissue)
1502	480	2502	240	Design issue fee
1503	640	2503	320	Plant issue fee
1460	130	1460	130	Petitions to the Commissioner
1807	50	1807	50	Processing fee under 37 CFR 1.17(q)
1806	180	1806	180	Submission of Information Disclosure Stmt
8021	40	8021	40	Recording each patent assignment per property (times number of properties)
1809	770	2809	385	Filing a submission after final rejection (37 CFR 1.129(a))
1810	770	2810	385	For each additional invention to be examined (37 CFR 1.129(b))
1801	770	2801	385	Request for Continued Examination (RCE)
1802	900	1802	900	Request for expedited examination of a design application

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ ) 110.00

**FEE CALCULATION****1. BASIC FILING FEE**

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description	Fee Paid
1001 770	2001 385	Utility filing fee	
1002 340	2002 170	Design filing fee	
1003 530	2003 265	Plant filing fee	
1004 770	2004 385	Reissue filing fee	
1005 160	2005 80	Provisional filing fee	
SUBTOTAL (1) (\$ )			

**2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE**

Total Claims	Extra Claims	Fee from below	Fee Paid
Independent Claims	-20** =	X	
Multiple Dependent	-3** =	X	

Large Entity Fee Code (\$)	Small Entity Fee Code (\$)	Fee Description
1202 18	2202 9	Claims in excess of 20
1201 86	2201 43	Independent claims in excess of 3
1203 290	2203 145	Multiple dependent claim, if not paid
1204 86	2204 43	** Reissue independent claims over original patent
1205 18	2205 9	** Reissue claims in excess of 20 and over original patent
SUBTOTAL (2) (\$ )		

\*\*or number previously paid, if greater; For Reissues, see above

**SUBMITTED BY**

(Complete if applicable)

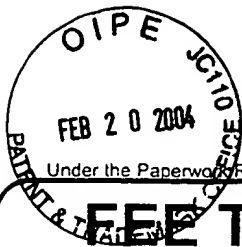
Name (Print/Type)	James D. Shaurette	Registration No. (Attorney/Agent)	39,833	Telephone	(509) 624-4276
Signature		Date	2/18/04		

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This collection of information is required by 37 CFR 1.17 and 1.27. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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# FEE TRANSMITTAL for FY 2004

Effective 10/01/2003. Patent fees are subject to annual revision.

☐ Applicant claims small entity status. See 37 CFR 1.27

TOTAL AMOUNT OF PAYMENT (\$ 110.00

## Complete if Known

Application Number	09/814,260
Filing Date	March 21, 2001
First Named Inventor	Scott E. Moore et al.
Examiner Name	T. Eley
Art Unit	3724
Attorney Docket No.	MI 22-2439

## METHOD OF PAYMENT (check all that apply)

☒ Check ☐ Credit card ☐ Money Order ☐ Other ☐ None

☒ Deposit Account:

Deposit  
Account  
Number  
Deposit  
Account  
Name

23-0925

Wells St. John, P.S.

The Director is authorized to: (check all that apply)

☐ Charge fee(s) indicated below ☒ Credit any overpayments

☒ Charge any additional fee(s) or any underpayment of fee(s)

☐ Charge fee(s) indicated below, except for the filing fee to the above-identified deposit account.

## FEE CALCULATION

### 1. BASIC FILING FEE

Large Entity		Small Entity		Fee Description	Fee Paid
Fee Code	Fee (\$)	Fee Code	Fee (\$)		
1001	770	2001	385	Utility filing fee	
1002	340	2002	170	Design filing fee	
1003	530	2003	265	Plant filing fee	
1004	770	2004	385	Reissue filing fee	
1005	160	2005	80	Provisional filing fee	
SUBTOTAL (1)				(\$)	

### 2. EXTRA CLAIM FEES FOR UTILITY AND REISSUE

Total Claims  -20\*\* =  X  =   
Independent Claims  -3\*\* =  X  =   
Multiple Dependent  =

Large Entity		Small Entity		Fee Description
Fee Code	Fee (\$)	Fee Code	Fee (\$)	
1202	18	2202	9	Claims in excess of 20
1201	86	2201	43	Independent claims in excess of 3
1203	290	2203	145	Multiple dependent claim, if not paid
1204	86	2204	43	** Reissue independent claims over original patent
1205	18	2205	9	** Reissue claims in excess of 20 and over original patent

SUBTOTAL (2) (\$)

\*\*or number previously paid, if greater; For Reissues, see above

## FEE CALCULATION (continued)

### 3. ADDITIONAL FEES

Large Entity Small Entity

Fee Code	Fee (\$)	Fee Code	Fee (\$)	Fee Description	Fee Paid
1051	130	2051	65	Page fee for each page or oath	
1052	50	2052	25	Surcharge - late provisional filing fee or cover sheet	
1053	130	1053	130	For filing a request for ex parte reexamination	
1812	2,520	1812	2,520	For filing a request for ex parte reexamination	
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1453	1,330	2453	665	Petition to revive - unintentional	
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1801	770	2801	385	Request for Continued Examination (RCE)	
1802	900	1802	900	Request for expedited examination of a design application	

Other fee (specify)

\*Reduced by Basic Filing Fee Paid

SUBTOTAL (3) (\$ 110.00

## SUBMITTED BY

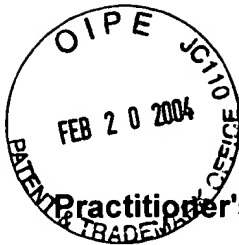
(Complete if applicable)

Name (Print/Type)	James D. Shaurette	Registration No. (Attorney/Agent)	39,833	Telephone	(509) 624-4276
Signature		Date	2/18/04		

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Practitioner's Docket No. MI22-1663

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
RECEIVED**

In re application of: Scott E. Moore et al.

MAR 02 2004

Application No.: 09/814,260

Group No.: 3724

Filed: 03/21/2001

**OFFICE OF PETITIONS** Examiner: T. Eley

For: Semiconductor Workpiece Processing Methods, A Method of Preparing Semiconductor Workpiece Process Fluid, and A Method of Delivering Semiconductor Workpiece Process Fluid to a Semiconductor Processor

**Office of Petitions  
Assistant Commissioner for Patents  
P.O. Box 1450  
Alexandria VA 22313-1450**

**EL979954615**

**STATEMENT ATTESTING TO TRANSMISSION OF P.T.O. CORRESPONDENCE  
UNDER 37 C.F.R. §1.8**

I state that on November 10, 2003, I transmitted the original Response to July 10, 2003 Office Action, including the below-listed papers by facsimile transmission to 703-872-9302." Copies of all papers are attached.

1. Transmittal Form (PTO/SB/21)
2. Supplemental Information Disclosure Statement with Form PTO-1449
3. Cited Reference (1)
4. Response to 7/10/2003 Office Action
5. Fee Transmittal (PTO/SB/17)
6. Request for Extension of Time (1 Month)

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statement may jeopardize the validity of the application or any patent issued therefrom.

Dated this 18<sup>th</sup> day of February, 2004, at Spokane, Washington.

  
**Natalie King**